

# LOADSENSOR

## Evaluation of airbag pressure sensors/gauges as load weighing devices for use on timber haulage trucks

### PROJECT TEAM

Dr Kevin McDonnell, University College Dublin\*  
 Dr Ger Devlin, University College Dublin  
 John Lyons, Coillte  
 Fionan Russell, Forest Industry Transport Group (FITG)  
 Roundwood Timber Ltd, Co Wicklow

\* Email: kevin.mcdonnell@ucd.ie

**COMPLETION DATE:** April 2009

### BACKGROUND

This project arose as a result of a recommendation in the Forest Industry Transport Group (FITG) Code of Practice for Timber Haulage, launched in December 2004: *COFORD in collaboration with the forest industry to undertake research and evaluation of load cells and mobile weighing devices*. Trucks vary in configuration, sensors can be placed at different locations. The most common truck configurations are the 5-axle configuration (42 tonnes g.v.w) and the 6-axle configuration (44 tonne g.v.w). All trucks and trailers are now air suspension as opposed to spring leaf suspension, which provides a higher design gross vehicle weights (d.g.v.w).

### OBJECTIVE

- To test the cost-effectiveness and accuracy of using load-weighing devices fitted to the truck air suspension system.

### PROGRESS

A vendor has been sourced to retro-fit the on-board weigh systems to both tractor unit and trailer. In addition to monitoring payload weights on-site, it is important to be able to monitor weights in transit and indeed remotely in real-time.

General Packet Radio Service (GPRS) is a packet-based, wireless communication service for passing data over mobile phone networks. It has become known as 'always-on data connection' for GSM mobile phones. It sends packets of data collected by the equipment on the truck, back to base in real time. It can also be used for voice communication between the vehicle and base.

Thus, by simply incorporating the GPRS network for data transfer, we can develop the technology so that trucks can

be monitored in real-time and any discrepancies in loading, unloading and indeed overloading can be established and marshalled correctly.

Research has shown that for payload control, the high quality AirWeigh system incorporates a unique air sensor principle which measures the load in the trailer's air suspension system. This works in conjunction with fifth wheel loadcells for even higher precision weighing results (Figure 1). The AirWeigh system can be fitted easily and is installed within one working day. The system can measure to within  $\pm 1.5\%$  which implies optimizing the full revenue per payload weight. For in-cab monitoring, the indicator is fixed in place (Figure 2). For out of the vehicle and on-site weighing, the wireless pad can also be used (Figure 3).

The team is proposing a working and research relationship with GPS vendors (BlueTree) from the completed GPSTRACK project to develop the on-board payload real-time information with their R COM tracker. This software will allow the COFORD-funded GPSTRACK and LOADSENSOR projects to connect well to provide an overall answer to real-time GPS tracking and on-board weigh systems for the haulage industry.

### ACTIVITIES PLANNED

This project is ongoing. Timber haulage was a prerequisite but due to the adaptability of the haulage sector today, timber trucks can interchange their workload between timber haulage, general haulage and bulk haulage. Final activities include finishing off the trial, completing the final report for COFORD, presenting and circulation of findings to the FITG, submitting a peer reviewed paper and a COFORD Connects note.



Figure 1: Jost fifth wheel load cell.



Figure 2: In-cab indicator.

Figure 3: Freeweigh wireless pad.